

We claim:

1. A plurality of ceramic aggregate particles
said particles comprising a plurality of solid particulates bonded together by
ceramic binding material, wherein the plurality of solid particulates have an average
particle size in the range from about 0.5 microns to about 1500 microns and the ceramic
binding material and plurality of solid particulates are separate phases; and
wherein a majority of said plurality of ceramic aggregate particles have a
substantially uniform cross-sectional shape.
2. The plurality of ceramic aggregate particles of claim 1, wherein at least a
portion of the solid particulates are abrasive particulates having particle sizes between
about 125 microns and 1500 microns.
3. The plurality of ceramic aggregate particles of claim 2, wherein the
abrasive particulates are selected from the group consisting of fused aluminum oxide,
ceramic aluminum oxide, white fused aluminum oxide, heat treated aluminum oxide,
silica, silicon carbide, green silicon carbide, alumina zirconia, diamond, ceria, cubic boron
nitride, garnet, tripoli, or combinations thereof.
4. The plurality of ceramic aggregate particles of claim 1, wherein a major
portion of the ceramic aggregate particles have an aspect ratio greater than one.
5. A plurality of ceramic aggregate particles according to claim 1, wherein a
major portion of the ceramic aggregate particles are rod-shaped.
6. A plurality of ceramic aggregate particles according to claim 1, wherein the
ceramic binding material comprises ceramic binder selected from the group consisting of
crystalline ceramic binder, non-crystalline ceramic binder, and combinations thereof.
7. A plurality of ceramic aggregate particles according to claim 6, wherein the
crystalline ceramic binder is selected from the group consisting of aluminum oxide,
magnesium oxide, titanium oxide, zirconium oxide, alumina-zirconia, aluminum silicate,

magnesium aluminate, magnesium silicate, boron carbide, silicon carbide, silicon-aluminum-oxynitride, titanium carbide, boron nitride, silicon nitride, silicon oxynitride, aluminum nitride, titanium boride, calcium phosphate, and combinations thereof.

5 8. A plurality of ceramic aggregate particles according to claim 6, wherein the non-crystalline ceramic binder is selected from the group consisting of fused silica, alkali silicate glass, alkaline earth silicate glass, lead silicate glass, borosilicate glass, aluminosilicate glass, aluminophosphate glass, and combinations thereof.

10 9. A plurality of ceramic aggregate particles according to claim 6, wherein the ceramic binding material comprises a combination of crystalline ceramic binder and non-crystalline ceramic binder and is selected from the group consisting of lithium aluminosilicate glass ceramic, magnesium aluminosilicate glass ceramic, fluoromica silicate glass ceramic, porcelain, earthenware, stoneware, and combinations thereof.

15 10. A plurality of ceramic aggregate particles according to claim 1, wherein a major portion of the ceramic aggregate particles have a circular cross-sectional shape.

20 11. A plurality of ceramic aggregate particles according to claim 1, wherein a major portion of the ceramic aggregate particles have a polygonal cross-sectional shape.

 12. A plurality of ceramic aggregate particles according to claim 1, wherein a major portion of the ceramic aggregate particles have surface connected porosity.

25 13. A plurality of ceramic aggregate particles according to claim 1, wherein a major portion of the ceramic aggregate particles have no appreciable surface connected porosity.

30 14. An abrasive article including:
 binder material; and
 a plurality of ceramic aggregate particles according to claim 2,
secured within said article by said binder material.

15. A coated abrasive comprising:
a backing having a major surface; and
an abrasive layer comprising a plurality of ceramic aggregate
5 particles according to claim 2, secured to said major surface of said backing by binder
material.

16. A nonwoven abrasive article comprising:
a porous lofty polymer filament structure having a plurality of
10 ceramic aggregate particles according to claim 2, distributed throughout the structure and
bonded therein by an organic binder.

17. A plurality of ceramic aggregate particles comprising a plurality of solid
particulates bonded together by ceramic binding material, wherein the ceramic aggregate
15 particles have a ceramic binder volume to solid particulate volume ration in the range from
about 0.2 to about 2.0 and the ceramic aggregate particles have a substantially uniform
cross sectional shape.

18. A plurality of ceramic aggregate particles comprising a plurality of solid
20 particulates bonded together by ceramic binding material, wherein the ceramic aggregate
particles have a ceramic binder volume to solid particulate volume ration in the range from
about 0.2 to about 2.0 and wherein a major portion of the ceramic aggregate particles have
a circular cross-sectional shape.

25 19. A plurality of ceramic aggregate particles comprising a plurality of solid
particulates bonded together by ceramic binding material, wherein the ceramic aggregate
particles have a ceramic binder volume to solid particulate volume ration in the range from
about 0.2 to about 2.0 and wherein a major portion of the ceramic aggregate particles have
a polygonal cross-sectional shape.

30 20. A plurality of ceramic aggregate particles comprising a plurality of solid
particulates bonded together by ceramic binding material, wherein the ceramic aggregate

particles have a ceramic binder volume to solid particulate volume ration in the range from about 0.2 to about 2.0 and wherein a major portion of said particles have surface connected porosity.

5 21. A plurality of ceramic aggregate particles comprising a plurality of solid
particulates bonded together by ceramic binding material, wherein the ceramic aggregate
particles have a ceramic binder volume to solid particulate volume ration in the range from
about 0.2 to about 2.0 and wherein said ceramic binder comprises, on a theoretical oxide
basis, at least 95 percent by weight Al_2O_3 , based on the total metal oxide content of said
10 ceramic binder.

 22. A plurality of ceramic aggregate particles comprising a plurality of solid
particulates coated and bonded together by a ceramic binding material, wherein the
ceramic binding material coats each exterior surface of the solid particulate, with a coating
15 such that the exterior surface of the aggregate particle closely conforms to the outermost
surfaces of the solid particulates therein, and wherein the thickness of the binding material
coating the outermost surfaces is no greater than about 0.05 microns to 150 microns.